

Lucas' account of the external anatomy of *Thelyphonus* is the only reliable one which we as yet possess. Short as it is, it clearly points out the great relation of the genus to *Phrynus*, and its essential difference from the scorpions.

As regards general distribution, I may say, that on the whole, particularly when compared with scorpions, the *Thelyphoni* are rare. I have only observed two life species, *T. scabrinus* and *T. (conf.) angustus*. Both were found at the foot of the Sikkim hills in damp places under the bark of old trees. They are crepuscular or nocturnal animals. When disturbed during the day, they try rapidly to escape, slightly raising themselves on their feet, holding up the cheliceres ready for defence, and erecting their caudal seta. Thus they progress very fast and soon disappear in any crevice or hole to which they find easiest access. In the evening they progress very quietly, moving their antennular first pair of feet in advance. When disturbed they stretch out these feet in a curve, and close their cheliceres over the mouth as a kind of protection, lying at the same time quite flat and motionless. I saw *T. scabrinus* issuing a peculiar fluid from two internal piloric appendages on each side of the anus, but the fluid did not have any offensive odour.

Mr. Peal of Sibsagar (Assam), who is an able observer and is always ready to give assistance on any subject connected with natural history, writes to me also that the *Thelyphoni* are generally found underneath the bark of decayed wood in groups, rarely singly. When first uncovered they (generally) lie *perdu* and try to pass as some smudge or fungus; lying close and flat, the legs gathered well together and the cheliceres folded in and closed in front of the mouth. On being disturbed they generally start up, throw out and up their cheliceres, gaping wide, erect the tail and invert it so as to feel if possible any object above them; sometimes they throw it quite over between the cheliceres. The first pair of feet, he says, seems to act more as feelers than as organs of progression. These animals seem to move either very slowly or very fast. In raising any fragment offered, they hold it aloft and stand well upon their legs, at least for a time.

Mr. Butler proposed to group the *Thelyphoni* in three sections, according to the number of denticles on the upper antero-interior edge of the second joint of the cheliceres. This is apparently a character of great importance, but like all others it is not without variation. I found that the relative proportions of the joints, particularly of the second, third and fourth, are almost more constant than the denticles alluded to. The form of the large spine on the fourth joint, and in fact the total length and ornamentation of the surface of the cheliceres, and the proportionate length of the feet are at least equally important in distinguishing the species.

The next useful character lies in the form of the anterior part of the thorax, whether it is depressed or rounded, and whether the anterior and lateral eyes are connected by a ridge or not. Next in importance is the form of the first abdominal shield. The length of the tarsi on the first pair of feet is also tolerably constant, and so is the form of the mandibles, but these, as a rule, are difficult to examine.

All other characters relating to the form of the body have a comparatively limited value; the single parts are very uniformly constructed in the different species, and are at the same time very much liable to variation. Thus the width of the abdomen is very variable, (most likely according to the different sexes), and so is the length of the abdominal seta, as regards number and size of the separate joints, etc.

Turning now to the sections, distinguished by Mr. Butler, there are some discrepancies to be noticed in the species referred to them by the author. In the first section, with five denticles on the second joint of the cheliceres, we find among others:

T. Brasilianus. I count in Koch's original figure of the species at least seven, almost equal, denticles on the antero-interior edge. Their number, it is true, is not mentioned in the description, but if Koch's figure has been found to be incorrect, the correction should have been noticed. I am not aware that anybody has pointed out an inaccuracy in Koch's figure.

Guerin's *T. caudatus* (in his edition of the *Régne animale*) is identified with *T. Antillanus* of Koch. This is, I think, hardly admissible. Guerin's figure represents a species with comparatively shorter limbs and with the third joint of the cheliceres smooth on the upper surface and much longer, than a comparison of Koch's figure of *T. Antillanus* can bear out. The only reason for the identification of the two figures is, I think, Guerin's note that *T. caudatus* is from the Antilles, but whether that particular specimen was from the Antilles is an other question.

The identification of *T. Assamensis* with *T. rufimanus* of Lucas is entirely inadmissible, as I shall point out in detail further on (see p. 134).

T. proscorpio of Latreille is an altogether doubtful species, and even should Koch's definition of the presumed same species be adopted, there is no sufficient reason for considering it as identical with *T. caudatus* of Lucas. I shall refer to this question again in the description of *T. scabrinus* (see p. 133).

T. Linganus. Koch's original figure gives six denticles on the second joint of the cheliceres, but does not refer to that number in the text. Is the figure incorrect in that respect?

Koch's *T. rufipes* is clearly not the same species as the one originally described by Lucas under the same name. The cheliceres and the limbs are in proportion to the body much longer in the former than in the latter; and, besides that, Koch's species has a slight central keel on the upper side of the

abdominal segments, and on the lower side the first segment is centrally grooved; neither of these characters are mentioned by Lucas, though when describing the respective parts he could hardly have overlooked these prominent characters. I consider Koch's *rufipes* as the same which he describes under the name of *proscorpio*; for the differences which he notices as distinguishing the two are decidedly of no specific value.

In the second group with two denticles on the second joint of the cheliceres, Butler describes *T. formosus*. My specimen of evidently the same species has six denticles of which, however, only two are well marked.

In the third division, including species with six well developed denticles, one is referred to under the old name of *T. caudatus*. I shall attempt to trace the history of this name when speaking of *T. indicus*, (n. sp.), which is possibly the same species as the one referred to by Butler from Madras and Bengal under the name of *T. caudatus*.

In addition to the three sections, I have one species, *T. Beddomei*, from the Anamallies, with seven denticles on the upper edge of the second joint. Among the very large number of specimens of *T. scabrinus*, (n. sp.), I found instances in which the second left joint has occasionally six denticles, while the right one had constantly only five. This clearly shews that the sections solely based upon the character, selected by Mr. Butler, can have only a very limited use.

Thus far I have commented upon Mr. Butler's determinations, but it must be understood that in the above instances my observations are mainly based upon descriptions and figures; for I have no other but Indian specimens for comparison. If those descriptions and figures were found to be incorrect, or not reliable, the mistakes had first to be pointed out and corrected, before a determination, based upon them, was admitted or rejected.

Finally, before entering upon the specific details, I must briefly allude to the geographical distribution of the genus. This distribution extends from South America and the West Indies northwards to Mexico, in a westerly direction through the ocean of little islands to the Philippines, touching North Australia, and stretching North as far as Corea, China and through the Malay Peninsula to Burma and India, where we meet with most of the species in the provinces of Assam and Sikkim, more rarely in Bengal and in South India, including Ceylon, all countries which have a marked admixture of Malayan types. No species is known to occur westward of the country alluded to, not even in Eastern Africa, as far as we know at present. This distribution resembles in so many respects that of the *PASSALIDÆ*, that I shall again return to its discussion at an early opportunity.

The species which I have to notice from India, are :

1. *T. scabrinus*, n. sp.—Cachar, Khasi hills, Assam, Sikkim.
2. *T. Assamensis*, Stol.—Assam, Sikkim.
3. *T. (conf.) angustus*, Lucas.—Sikkim, Martaban (Moulmein), and Penang.
4. *T. formosus*, Butler.—Martaban (near Moulmein).
5. *T. indicus*, n. sp.—South India, W. Bengal, and Jahore, North of Singapore.
6. *T. Beddomei*, n. sp.—South India (Anamallies).

I will make my descriptions as complete* as possible, and will not only give figures of single parts of the body, but also of the perfect specimens, in order to facilitate the determination by identification and not by guess. Figures of single parts are undoubtedly very useful, but they are not sufficient; they do not convey an exact idea of the relative proportions of all the parts of the body, and without paying due regard to these, a really reliable determination of *Thelyphoni* is in my opinion impossible.

1. *THELYPHONUS SCABRINUS*, n. sp. Pl. XII. Fig. 1.

The whole upper surface granular; length† of the five terminal joints of the cheliceres equalling the length of the first eight abdominal segments; the length of last pair of feet equals exactly, or very nearly, the total length of the cephalothorax and abdomen; second joint of the cheliceres with five spines, third with a spine on the upper and lower inner edge, and equal in length to the fourth joint; a sharp upper ridge connecting the central and lateral eyes; first lower segment of abdomen of moderate size, depressed, with a broadly convex posterior edge.

Hab.—Sikkim, Assam, Garo-, Khasi- and Cachar- hills.

The cephalothorax is slightly convex, with the anterior ocular portion somewhat higher, but on the whole depressed and flattened, roundly obtuse in front. The two anterior blackish eyes are separated by a moderately levated smooth tubercle; from its anterior edge proceeds a sharp ridge curving outward, and running along the upper edge to the three lateral eyes, which are pale yellow. The ocular portion is more densely and somewhat more coarsely granular than the thoracic one; the former has a longitudinal central groove,‡ and parallel to it an indistinct elevation on either side, placed nearer

* I know that few would take the trouble of reading them on account of their length, but everybody, who has attempted to determine Arachnoids, will know that a description, *unless fully detailed, is worthless for an accurate determination.*

† This length is of course measured as far as the joints can be opened without disconnecting the articulation; it is not the aggregate length of the separate joints.

‡ I shall speak of this as the *cephalic groove*, and of the one on the posterior half of the cephalothorax as the *thoracic groove* and the *lateral thoracic depressions*.

to the margins ; the latter has also a longitudinal groove which is most depressed in the centre ; anteriorly from the central depression proceed two lateral grooves to the postocular depressions, and from the centre itself two on either side towards the margin. The sternum is triangular, obtuse in front.

The abdomen is moderately depressed, very elongately ovate, across the middle about one-twelfth of an inch broader than the thorax ; granular above, with the posterior segmental edges crenulated ; the muscular points* are round and well marked on the second to eighth segment, the three last segments are mostly smooth, the last joint being roundly compressed towards the upper end, with a small vertical and elliptical gland on either side. Below, the first nine segments are finely scrobiculate punctated at the sides, and smooth along the centre ; the first joint is largest, equalling in length the three last ones, with the central portion of the posterior edge somewhat convexly produced ; the second joint is barely curved at the edge and the third, like the succeeding, quite straight. The muscular impressions are elongate and well marked on the fourth to seventh joints, but a little less distinct and more approximate on the first and second joints. The caudal seta very nearly equals in length the whole of the body, it is always peculiarly attenuated towards the end, and all the joints are more or less hairy. The length of the joints and their number is very variable ; the first is as usually the longest, the succeeding either gradually decrease in length, or some of them situated near the middle are longer than the rest.

The cheliceres may be regarded as of proportionate size to the body. The two first joints have each a strong spine in front, provided with a sharp joint and a small denticle on the inner side. The second joint has the upper side depressed, anteriorly moderately produced, with three small denticles on the inner edge, and two larger ones on the anterior one ; the outermost larger denticle is somewhat more distant from its preceding one, than any of the others from among each other, but all are directed forward and inward ; the inner concave side of this joint is coarsely granular, and the lower anterior corner has two denticles, of which the terminal one is the larger. The third joint on the upper side is equal in length to the second, and laterally along the middle to the fourth ; it always has a small denticle on the inner anterior corner, and a larger one in front of the middle of the lower edge. The anterior process of the fourth joint equals in length the fifth joint, it is depressed, smoothish, with a rapidly contracted sharp point and serrated edges, the posterior serration being slightly coarser

* These points or depressions are very often called stigmatic points, but they have nothing in common with the stigmata, which lie under the edge of the first lower abdominal segment, and are not externally visible ; the depressions are merely places of the inner attachment of the muscular bundles which connect the upper chitinous integument with the lower one.

and beginning with two somewhat larger denticles at the base of the process; this fourth joint also has a minute denticle on the lower anterior corner. The fifth joint is invariably conspicuously shorter and thinner than the fourth, anteriorly with a strong depressed, sharply pointed process which is somewhat more coarsely serrated posteriorly than anteriorly; the lower anterior corner of this joint has two denticles, the anterior of which is somewhat stronger than the corresponding denticle of the preceding joint. The sixth joint, or movable claw, is somewhat longer than the process of the fifth, slightly inwardly curved, sharply pointed, above and below with a finely serrated edge, internally on the concave side with a smooth ridge, and two equally smooth ones are externally on the convex side.

The first pair of feet are thin; the terminal eight tarsal joints are shorter than the preceding metatarsal one. The coxal and femoral joints of the three other pair of feet are thick, depressed, very densely and finely granular.

Colours. Full grown specimens are above brown, slightly darker on the cephalic portion of the thorax and on the cheliceres, except near their ends; all the feet from their tibial joints to the end are red, and each joint of the three posterior pairs has near its terminal upper edge a black dot; the last joint of the maxillæ, the ocular tubercle and the claws are black. On the lower side the cheliceres, the prosternum, the abdomen are more or less dark brown, the coxæ of the feet and the sternum are yellowish brown and the feet reddish brown.

The following are the dimensions of a specimen of very nearly the same size as the one figured by Koch as *T. proscorpio*.

Total length of cephalothorax and abdomen,	37 mm.
Length of cephalothorax,	13.6 "
" " abdomen, including the three terminal joints,	23. "
" " cheliceres, measured above, without basal joint,	17.5 "
" " first pair of feet, excluding the basal or coxal joint,	44. "
" " second ditto,	25. "
" " third ditto,	26.5 "
" " fourth ditto,	36. "
" " abdominal seta, ditto,	36. "

In young specimens (with a total length of about 20 mm.) the abdomen is often slightly longer in proportion to the length of the cheliceres, but there is not the least difference in structure. The body and cheliceres are olivaceous brown, the process of the fourth joint, the whole of the fifth and sixth joints of the cheliceres red; coxal and femoral joints of all feet olivaceous, the remaining joints and the seta yellowish red. On the lower side, the basal joint of cheliceres is pale brown with the spinal processes red, the three following olivaceous brown, the two terminal red; prosternum

olive brown, coxæ and sternum yellowish brown, abdomen pale brown, feet of the same colour as on the upper side.

The species grows to a large size: the largest specimen from Sikkim has the total length of cephalothorax and abdomen 50 mm.

In Sikkim the species is found from 1000 to about 4000 feet in damp places under wood, more rarely under stones. It is the most common of all the Indian *Thelyphoni*. I have examined about forty specimens of all sizes from 20 to 50 mm., and all exactly agree in structure.

It seems very improbable (judging from the localities recorded by Mr. Butler) that there should be no specimens of this species in the British Museum, but I am not certain whether Mr. Butler refers to it under *T. rufimanus* or *proscorpio*. He must have thought it not worth while reading my description and comparing my figure of *T. Assamensis*, or else he could not have referred it to the present species.

The original name *T. proscorpio* of Latreille (Gen. Crust. et Insect., 1806, p. 130) was, strictly speaking, proposed for Linné's *Phalangium caudatum*. In spite of the numerous references to figures in various old books, it is entirely impossible to trace the species which Latreille had in view. The name would have had to be entirely ignored, but for its timely rescue by Koch who figures a Javanese species under Latreille's name, giving the same synonyms, (Arachniden, Vol X, p. 26, pl. 333, fig 771). Judging from mere figures, we are, I think, justified to regard the species, delineated by Koch, as different from Lucas' *Th. caudatus* (to which I shall refer further on). Koch's *proscorpio* would appear to have the joints of the cheliceres shorter and thicker, the fifth much stronger than the fourth, (while the reverse is observed in Lucas' figure), the centre of the anterior upper abdominal joints keeled, the first, lower abdominal joint very large and with a longitudinal groove. I hardly think that Lucas could have overlooked the last character, when describing the first lower abdominal joint; and besides that in his species he particularly refers to a separate small spine preceding the great spinal process on the fourth joint of the cheliceres; it is indicated in his figure, but not a trace of it is to be seen in Koch's figure. For these reasons, it seems to me clear that we have to consider Latreille's re-established *Th. proscorpio* as distinct from Linné's re-established *T. caudatus*.

Butler also doubtfully refers Lucas' *T. angustus* to his compound mixture of *Th. proscorpio*, but with still less reason, as I shall presently shew.

2. THELYPHONUS ASSAMENSIS, Stol. Pl. XII. Fig. 2.

T. Assamensis, Journ. A. S. B. Vol. xxxviii, Pt II, 1869, p. 205, pl. xix, fig 1.

The whole upper surface granular; the length of the five terminal joints of the cheliceres fully equals the first nine abdominal segments; the last foot is

longer than the cephalothorax and abdomen together; second joint of cheliceres with five subequal spines, four being on the inner, one somewhat more distant on the upper anterior edge; third joint with a single strong spine on the lower median edge, it is longer and slenderer than the fourth joint, whose anterior process is long, subcylindrical, smooth posteriorly, denticulate on the antero-interior edge; a sharp denticulate ridge connects the central with each group of lateral eyes; first lower abdominal segment depressed, particularly in the middle, with the posterior edge convexly produced.

Hab.—Assam and Sikkim. The species is much rarer than the previous.

It will be seen from this abbreviated characteristic that the species is very closely allied to the previous, but after having examined several specimens of each, exactly agreeing with each other, I think they must be looked upon as two distinct species. I have already given a detailed description of the present one.

In size and coloration it almost exactly agrees with *T. scabrinus*, but is slightly more depressed, the cheliceres are somewhat more slender and longer. The spines on the second joint are subequal, four on the inner edge, and one distant one on the upper edge; the form of the third joint and the process on the fourth differ essentially, as may be readily seen by a comparison of the enlarged figures of the respective cheliceres. The feet are also proportionately longer than in *T. scabrinus*; the eight tarsal joints on the first pair equal in length their preceding metatarsus. Internally along each group of lateral eyes are two imperfect ridges of granules somewhat parallel to the central cephalic groove.

As regards general form and proportional size of the joints of the cheliceres *T. Assamensis* is also closely allied to *T. caudatus*, as emended by Lucas, but the denticles on the second joint are very different.

Butler (loc. cit. p. 202) considers *T. Assamensis* as the adult of *T. rufimanus* of Lucas. If such identifications were admitted, we might better give up the idea of distinguishing at all species of *Thelyphoni*; a superficial comparison of the respective figures will shew that the cheliceres and limbs of *T. Assamensis* are proportionally very much longer, than could possibly be attributed to a change in age. Lucas particularly refers to the shortness of the cheliceres* in his description of *T. rufimanus*, their third joint is said to have no spines whatever; the first lower abdominal segment is stated to be very large. Besides that it appears to me, judging from the figure, that there is in Lucas' species no sharp ridge between the central eyes.

3. *THELYPHONUS (conf.) ANGUSTUS*, Lucas. Pl. XII. Fig. 3.

♀ *T. angustus*, Lucas, Guerin's Mag. de Zool. for 1835, pl. 10, fig. 3.

Cephalothorax and abdomen long and slender, finely granular above; cheliceres in young almost entirely smooth, in old specimens with the exception of

* They are much shorter than the abdomen.

the second joint mostly smooth, the length of the five terminal joints is about equal to that of the first six abdominal segments, which is slightly more than the length of the cephalothorax; the length of one of the last feet, or that of the caudal seta, is considerably less than that of the cephalothorax and abdomen together; cephalic portion of thorax at the sides between the central and lateral eyes rounded; second joint of cheliceres with five denticles, of which the two uppermost are subequal and larger than the three others; third joint not longer than the fourth, with a denticle on both the upper and lower inner edges; first lower abdominal segment depressed, with the posterior central edge somewhat narrowly produced.

Hab.—Penang, Moulmein, and Pankabari (Sikkim).

I have six specimens for examination, two from each locality; they all agree in the above characters, and appear to me to be referable to Lucas's species.

The slenderness of the body and the shortness of the cheliceres are very striking distinctions as compared with the two preceding species. The cephalothorax is only about half the total length of the abdomen, with the anterior end somewhat narrowly rounded, convex above, the cephalic portion being more distinctly, though still very finely, granular than the thoracic one; the median ocular tubercle is low, rounded, smooth; the central eyes small, black; the sides between them and the lateral amber-coloured eyes rounded, with a slight longitudinal elevation above the latter. The cephalic groove is distinct, beginning a short distance behind the ocular tubercle. The central thoracic impression is rather large, with a very fine groove passing through it; lateral impressions rather indistinct. Prosternum on the face obtusely keeled with a short anterior broad point; sternum ovately subtriangular, smooth, anteriorly subtruncate.

The first nine abdominal shields are on the upper side very finely granulated, with slightly raised lateral and posterior edges. The muscular rounded pits are well marked from the second to the eight segment. The lateral kin is densely and very finely punctated and scrobiculate. The first segment has the middle of the posterior edge narrowly produced, and its length laterally is equal to that of the two succeeding ones, all three are broadly laterally punctated, smooth in the middle, while the other segments are mostly smooth, with only a few fine scattered dots.

The caudal seta is always shorter than the total body; it is distinctly hairy in young specimens, but the hairs easily wear off in adults.

The cheliceres are almost quite smooth in young specimens, while in adults the second joint is on the upper side densely punctated, the other joints are very sparingly covered with hair, these becoming, however, more numerous towards the tips. The first joint is flattened, with two anterior diverging processes, each terminated by a short spine, which has the appearance as if it had

been set into the abbreviated end of the process. The remaining five joints are in form, relative size and denticulations, exactly like those of *Th. scabrinus* on a small scale, with the single exception that, as already observed, they are mostly smooth. The eight tarsi of the first attenuated pair of feet are considerably shorter than the preceding metatarsus. The remaining feet have the femoral joints depressed and finely granular above.

Colour of adult, above, blackish brown, somewhat less pure on the abdomen and with the three terminal joints of the cheliceres reddish brown, coxal and femoral joints of all feet olivaceous brown, remaining joints bright red; lower side entirely reddish brown, only the second and third joints of the cheliceres, the points or denticles of all the other joints, the prosternum, the femora, the external margins of the abdominal segments, including nearly the whole of the four terminal ones, are blackish; the shades of brown, however, slightly differ: the last joint of the cheliceres being rather bright red, the first pair of feet reddish brown, the coxæ and sternum yellowish brown and the abdomen chesnut brown; the seta is reddish brown.

Younger specimens have all the upper dark brown as well as the lower reddish coloration paler, but the ends of the cheliceres are bright red and the feet and caudal seta yellowish red. In the four specimens from Sikkim and Penang the femoral joints of the first pair of feet are dark, in the two specimens from Moulmein the whole of these feet are reddish brown.

The largest specimen from Sikkim measures:—

Total length (excluding the seta),	31	m.m.
Length of five terminal joints of cheliceres,	11	” ”
” ” cephalothorax,	10	” ”
” ” abdomen,	20	” ”
” ” first pair of feet (excluding the coxa),	26	” ”
” ” second,	16·5	” ”
” ” third,	17·5	” ”
” ” fourth,	25·5	” ”
” ” caudal seta,	26·5	” ”

A comparison of my figures and description of the present species with those of Lucas (loc. cit.) will show, that the form of the body, the proportions of the different joints and the coloration agree as closely as could be expected, so much so that I can scarcely doubt the identity of the two. There is only one point in Lucas' description which, although in itself apparently of no very great importance, is contradictory to what can be observed in my specimens. Lucas says that the third joint of the cheliceres is smooth on the upper inner edge, and provided with a spine only on the lower edge, while in all my specimens there is a distinct though very small spine on the upper edge and a somewhat larger one on the lower. As Lucas' type is in the Paris Museum, it will be comparatively easy to settle this point by a re-examination of the specimen.

4. *THELYPHONUS FORMOSUS*, Butler. Pl. XII. Fig. 4.

Ann. and Mag. nat. hist. 1872, vol. x, p. 203, pl. xiii, fig. 4.

Upper side of body finely granular, of cheliceres nearly smooth, length of the five terminal joints of cheliceres very nearly equalling that of the first nine abdominal segments; second joint of cheliceres on the upper anterior edge with six very small denticles, of which only the two middle ones are pointed, fourth and fifth joints more swollen than the two preceding ones; edge between the central and lateral eyes swollen, rounded, not carinated; length of one of the last feet almost exactly equals the cephalothorax and the abdomen; first lower abdominal segment very large, with the median posterior edge produced, but still truncated, and depressed.

Hab.—Moulmein, (in the Martaban province).

The cephalothorax is comparatively small, its length being only slightly more than half that of the abdomen; it is convex, anteriorly somewhat narrowly rounded, with the cephalic portion behind the ocular tubercle transversely rugose, further on rugosely granular, the granulation being considerably stronger than on the thoracic portion. Ocular tubercle and central eyes small, black. Cephalic groove with slightly raised margins. Edges beginning a short distance behind the central eyes and extending to the laterals broadly rounded and swollen. Median and lateral thoracic grooves and impressions narrow, but distinct and shining smooth. Prosternum narrow, subcarinate; the sternum rather elongately trigonal, anteriorly obtusely rounded, with the sides posteriorly sloping.

The first nine upper abdominal segments very finely granular, with crenulated posterior margins; the muscular rounded pits are distinct on the first eight segments, the three last narrow segments are smooth. Sides punctured, and with small scattered elongated tubercles, of which a median row slightly exceeds the others in size. On the lower side the two first segments are strongly rugose at the sides, the others only punctated, the median portions being smooth, except on the narrow second and third segments on which the punctuation extend almost to the centre. The first segment is largest, with the posterior part centrally produced, but with the edge truncate. The first pair of feet is entirely smooth, the second and third have the femoral joints, and the last all the joints, scrobiculately punctated, the punctuation extending even to the hinder sides of the coxæ.

The cheliceres are sparsely hairy, except on the inner sides and near the tip. Each first joint has anteriorly a strong sharply pointed process. The second joint has on the upper margin six denticles, four being on the inner edge,—the two lower obtuse, the two upper pointed and longer,—the fifth and sixth are on the anterior edge, both very small and indistinct, the last is distant from the rest; the anterior half of the joint is transversely rugose; the lower anterior edge has two subequal very small denticles. The third

joint is slender, slightly longer than the second, with numerous sharp granules on the upper rounded inner edge, and one strong spine in the middle of the lower edge. The fourth joint is not longer but considerably thicker than the third, with a long, inner, rather equally slender, smooth, anterior process, with its termination shortly bifid and internally provided with a compressed tubercle. The fifth joint is equal in length to the preceding, but again more inflated, with a short and broad anterior process, sharply serrated on both edges. The sixth joint is moderately curved, externally grooved and with the upper and lower edges finely serrated, and internally pilose.

The length of the eight tarsi of the first pair of feet is less than that of the metatarsus. The femora of the other feet are moderately thickened and depressed.

Colours. Above,—cheliceres and cephalic thorax brilliantly shining blackish brown, remainder of cephalothorax and abdomen dull blackish; maxillæ with the exception of their tips and all feet bright reddish chesnut; caudal seta somewhat deeper red; sides of abdomen fulvous brown. Below,—cheliceres on the first joint dark brown, remaining joint blackish brown, sternum, coxæ and feet reddish chesnut, abdomen darker chesnut.

I have some years ago collected this species near Moulmein, wherefrom Butler's type was received. If the second joint of the cheliceres of the type specimen has no indication of any other but two denticles, the occurrence must be looked upon as an accidental variation. The form of the body and of the cheliceres is so characteristic, that the species cannot be easily mistaken with any other. The following are the dimensions of an apparently full grown specimen:—

Total length of cephalothorax and abdomen,	26	m. m.
Length of the first terminal five joints of cheliceres,	13.5	„ „
„ „ cephalothorax,	9.	„ „
„ „ abdomen,	16.5	„ „
„ „ first pair of legs (without coxæ),	28.5	„ „
„ „ second,	15.5	„ „
„ „ third,	16.5	„ „
„ „ fourth,	24.5	„ „
„ „ caudal seta,	19.	„ „

5. THELYPHONUS INDICUS, n. sp. Pl. XII. Fig. 5.

An *Thel. caudatus* auctorum!

Upper side very finely granular; the first nine abdominal segments, centrally, with a partial, very fine carina; cheliceres mostly smooth, except on the second and third joints which are densely punctated; the length of the five terminal joints of the cheliceres equals that of the first seven or seven and a half abdominal segments; the length of one of the last pair of feet is very nearly equal to that of the cephalothorax and abdomen taken together;

a short sharp edge in front of the lateral eyes, not continuing to the central eyes; second joint of cheliceres with six small, subequal denticles, third not longer than the fourth, with a little spine above and below; first lower abdominal segment very large, convex, centrally grooved.

Hab.—South India, Western Bengal, and the Malay Peninsula.

The cephalothorax is rather obtusely rounded, with the perpendicular front side perfectly smooth; the ocular tubercle is also smooth and very high, the circumference round each black central eye being depressed. From the ocular tubercle passes in a curve a rounded edge below the central eye, and after a short distance from this one joins a thin, but sharp and finely serrated, ridge which continues to the lateral eyes; the latter are pale amber yellow. The upper side of the cephalic thorax is flattened, indistinctly granularly rugose, with a rather small central groove. The thoracic portion is very finely granular and most minutely punctated, with the central depressions distinct, but the lateral ones ill-defined. The abdomen is one sixth broader than the thorax, very finely granular, with a fine central carina, scarcely traceable on the fourth and fifth segments; all have a posterior submarginal row of very minute granules; the last three narrow segments are smooth. The first segment on the lower side is very large, smooth, centrally grooved, with the posterior edge somewhat produced and broadly truncate. All the other segments are finely rugose; the second and third being very narrow.

All the joints of the cheliceres are internally distinctly pilose. The first joint is sparingly punctated; on the median anterior part it is transversely rugose, terminating with a sigmoid, pointed process. The second joint has an anterior rounded shovel-like edge provided with six subequal denticles, of which the two outermost are more distant from the other four than these among themselves; on the lower edge there are two unequal denticles. The third joint is short, with a small denticle at the inner upper end and a larger one on the middle of the lower inner edge. Both the second and third joints are densely punctated above and outwardly, and granular below; the following are mostly smooth. The fourth joint is slightly thicker than the third, with a long, pointed, anteriorly and posteriorly serrated process; it has no spine on the lower side. The fifth joint is again somewhat more inflated with a short, broad, depressed process, sharply serrated on both sides; on the front margin of the lower side there is a minute denticle. The sixth joint is slender, considerably longer than the process opposite to it; the upper and lower inner edges are, as usually, finely serrated, and near the tip there is on the upper edge a conspicuously enlarged tubercle.

The tarsi on one of the first pair of feet are shorter than the preceding metatarsus. The femoral joints of the other feet are compressed, granular

above, smooth below ; the last foot is very little shorter than the whole body, and the caudal seta fully equals in length the latter, it is multi-articulate and densely pilose.

Upper side of cephalothorax and abdomen dull brownish black ; cheliceres shining deep chesnut, feet and seta bright chesnut. Lower side,—cheliceres same as above, feet, sternum and first abdominal shield bright chesnut, rest of abdomen deeper chesnut.

Total length of cephalothorax and abdomen,	35.5 m. m.
Length of the five last joints of cheliceres,	17.3 " "
" " cephalothorax,	12.1 " "
" " abdomen,	22. " "
" " first pair of feet (with coxæ),	38 " "
" " second,	22. " "
" " third,	24. " "
" " fourth,	33. " "
" " caudal seta,	36. " "

The preceding description and the figures refer to a South Indian specimen which I had received from Major Beddome.

Another specimen was collected by Mr. Ball near Sirgúja in Western Bengal. It agrees with the former in every particular, except that the denticles on the second joint of cheliceres are somewhat stronger, and that the fourth and fifth joints are not so much inflated, both being only slightly thicker than the third.

Several other specimens were obtained by Mr. Wood-Mason's collector at Jahore, at the extreme south end of the Malay Peninsula. These also agree in every point of structure, the proportions of the body, &c., with the type form, but the first, second, third and fourth joints of the cheliceres are more densely punctated, while the tumidity of the fifth is intermediate between the South Indian and the Bengal specimen. The six denticles on the second joint of the cheliceres are well developed, and the process on the fourth is a shade broader than in either of the two Indian specimens.

Judging from the references to the two localities Madras and Bengal, it would seem probable that the present species had been alluded to by Mr. Butler under the name *Th. caudatus*, though the remark referring to the broad body and depressed abdomen would rather apply to the next species.

But here the question arises what is *Thelyphonus caudatus* = *Phalangium caudatum* of Linnæus ? Mr. Butler (loc. cit.) gives among others as the reference of *T. caudatus* Linné's Syst., and Fabricius' Ent. Syst. If anybody will look through these references, he will, I think, find very little satisfaction in the definition of *T. caudatus*.

As habitat of the species, Mr. Butler gives Ceylon, Madras, Bengal and Tenasserim, and says that it is a broad, well marked form, having

six teeth on the second joint of cheliceres and a very depressed* abdomen, and that it has been confounded with two, if not three, other species! Now I confess after having carefully looked over the references alluded to and Mr. Butler's notice, I have not succeeded in tracing Linné's *T. caudatus*, nor will, I think, anybody else do so; and if the species has been confounded by older writers, as no doubt it was, Mr. Butler has only added his share to that confusion.

Let us see whether and how far we might be justified to adopt the name *T. caudatus*.

Linné named a species in 'Syst. naturæ 619, n. 2' *Phalangium caudatum*, which he characterises as '*chelis ramosis, ano setifero.*' In Museum Lud. Reg., 1764, p. 426, the celebrated author describes the same species in detail and gives 'habitat in Java,' quoting at the same time Seba's figures 7 and 8 on pl. 70 of his Thesaurus. To determine anything according to Seba's figures is an altogether hopeless case, but we know that Linné's description of *Ph. caudatum* was drawn up after a Javanese specimen, and we must, therefore, look to Java for Linné's *Ph. caudatum*. When we see through our literature we find, I think, only two descriptions and figures, which can bear out any comparison with Linné's type, and these are Lucas' *Th. caudatus* ex Java, and Koch's *Th. proscorpio* ex India orientali et Java.

In reading carefully over Linné's description, I think, the passages corpus.....ferrugineum,.....chelæ.....articulis 5 constructæ..... β (*i. e.* articulus tertius) subrotundus, inermis,... γ (*i. e.* art. quartus) subrotundus..... are decidedly more in favour of Lucas's than of Koch's figure. If we, therefore, wish to retain Linné's name we can reasonably, I believe, only adopt it in the form in which it had been introduced into science by Lucas in his Monograph of the genus in Guérin's Mag. de Zoologie for 1835. Any other meaning, which we force upon Linné's name, is more arbitrary than this, still I do not wish to leave altogether the references of previous authors to this name without notice.

I have already (p. 133) stated the reasons, which appear to me to indicate that Koch's reinstated *Th. proscorpio* of Latreille is distinct from Lucas' *Th. caudatus* of Linné.

Fabricius copied Linné. In Syst. entomologiæ, 1775, p. 441, he only added 'habitat in India orientali,' and I do not think it improbable, that several specimens of *Thelyphoni* had been sent by the French and German Missionaries from South India to European Museums.

Pallas' two figures most probably refer to *Th. scabrinus*. He also had Indian specimens.

Latreille, both in his Hist. nat. des Crust., p. 130, pl. lx, fig. 4, and in his Gen. Crust., p. 130, evidently confounded various species from differ-

* Linné says: abdomen ovato-oblongum, supra et subtus gibbum.

ent parts of the world under one name. He does not give any descriptions.

The figure in Guerin's *Régne animale* would, if correct, represent a species distinct from *Th. Antillanus*, Koch, as already (p. 128) observed.

Douges and M. Edwards' figure in their edition of the *Régne animale* most likely represents Koch's *T. proscorpio*.

I do not think it would be profitable to go further with this review, even if I had all the old books at hand. I have looked over many of these *historical* figures and descriptions, and if anybody wishes to study the history of the genus, he might do the same, but if he wishes to *determine his species*, he will find it much more profitable, to ignore every reference written prior to 1835, the date of Lucas' Monograph of the genus.

6. THELYPHONUS BEDDOMEI, n. sp. Pl. XII. Fig. 6.

Upper side of body granular, of cheliceres sparsely punctated; length of the five terminal joints of cheliceres equal to the first eight abdominal segments, these have on the upper side a median thin ridge; second joint of cheliceres with seven denticles on the upper edge; third joint on upper side shorter than the fourth, above and below with a spine; the length of one of the last limbs very nearly equals the total length of the body; a very fine short ridge in front of the lateral eyes; first lower abdominal segment enlarged, along the middle indistinctly grooved, with the posterior edge centrally much produced and rounded.

Hab.—Annamally mountains, South India.

The cephalothorax is much higher anteriorly than posteriorly, rounded in front, with the ocular tubercle prominent, smooth, its posterior portion being separated by a fine incomplete transverse groove from the intra-ocular one; central eyes of moderate size, dull yellowish; lateral eyes amber coloured, with a short, very thin and finely serrated ridge in front of them, disappearing already at the middle of the distance between the lateral and central eyes. Cephalic thorax granularly rugose, shining; thoracic portion conspicuously broader, more finely granular, dull. Cephalic groove deep, median thoracic and postocular pits and lateral groove well developed, smoothish, shining. Sternum elongately semi-elliptical. Abdomen rather broadly ovate and depressed, above granular, with very slightly raised posterior and lateral margins, the first eight segments with a central longitudinal fine ridge. Sides granularly scaly. Lower surface almost smooth, with sparse fine pits; first segment much larger than any of the others, depressedly convex, longitudinally indistinctly grooved, and with the central posterior edge considerably and rather narrowly and roundly produced.

First joint of cheliceres with the usual anterior process, provided with a rapidly attenuated sharp point. Second joint on the upper edge with seven denticles, of which the outermost is the smallest and the median on

the inner anterior corner the largest; below with two subequal denticles. Third joint with a distinct denticle on the upper and a slightly larger one on the lower side, the latter is accompanied by a minute sharp granule. These two joints are above and below rather densely punctated. The fourth joint is more swollen and larger than the third, with a depressed, anteriorly and posteriorly sharply serrated process, and a little spine on the median anterior lower edge. Fifth joint somewhat thinner than the previous, with a quite similar process than on the preceding joint, but slightly shorter, and also with a denticle on the lower side. Sixth joint, or movable claw, long, with the upper and lower inner edges serrated.

Tarsi of first pair of feet slightly shorter than the preceding metatarsus. All other feet with compressed, and on the upper side finely granular, femoral joints. Caudal seta slender, with rather elongated, hairy joints; its length equals that of the whole body.

Body including the seta, above, dark brown, on the cheliceres and on the cephalic portion of the thorax shining blackish brown; feet chestnut; lower side, deepest brown on the cheliceres and on the posterior end of the abdomen, dark brown on the first joint of cheliceres and on the anterior part of the abdomen, and lighter brown on the coxæ of the feet and on the sternum.

Total length,	40.5 m. m.
Length of the five terminal joints of cheliceres,	19 " "
" " cephalothorax,	14.5 " "
" " abdomen,	25. " "
" " first pair of feet,	42.5 " "
" " second,	23.2 " "
" " third,	25.5 " "
" " fourth,	28. " "
" " caudal seta,	39.5 " "

The number and distribution of the denticles on the second joint of the cheliceres, the broad abdomen, the form of the first lower abdominal segment, and the slightly longer limbs distinguish the present species from the previous.

Explanation of plate XII.

Fig. 1. *Thelyph. scabrinus*, n. sp., p. 130; 1a, right chelicer, enlarged twice the nat. size; 1b, four anterior lower abdominal segments.

Fig. 2. *Thelyph. Assamensis*, Stol., p. 133, right chelicer, enlarged twice the nat. size; 2a, four anterior lower abdominal segments.

Fig. 3. *Thelyph. (conf.) angustus*, Lucas, p. 134; 3a, left chelicer enlarged three times the nat. size; 3b, four anterior lower abdominal segments, enlarged twice the nat. size.

Fig. 4. *Thelyph. formosus*, Butler, p. 137; 4a, right chelicer, and 4b, first four lower abdominal segments, both enlarged twice the nat. size.

Fig. 5. *Thelyph. indicus*, n. sp., p. 138; 5a, right chelicer, in twice the nat. size; 5b, four first lower abdominal segments.

Fig. 6. *Thelyph. Beddomei*, n. sp., p. 142; 6a, left chelicer, in twice the natural size; 6b, four first lower abdominal segments.

NOTE ON THE GENUS GYMNOPS, W. BLANF., (LACERTIDÆ),—
by W. T. BLANFORD, F. G. S., C. M. Z. S.

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In the Journal of the Asiatic Society of Bengal for 1870, Vol. xxxix, Pt. II, p. 357, I proposed to distinguish a new and peculiar form of *Ophiops* from Chhatisgarh by the subgeneric title of *Gymnops*. The species, to which I applied the name of *Ophiops (Gymnops) microlepis*, differs from the typical forms of *Ophiops* found in India and Western Asia in its more elongate proportions, longer tail, single postnasal and minute dorsal scales.

Dr. Stoliczka has since obtained the same species in other parts of India and especially in Kachh (J. A. S. B. 1872, Vol. xli, Pt. II, p. 90 and Proc. A. S. B. 1872, p. 74), and he has adopted the name *Gymnops* as a generic term, founding the distinction from *Ophiops* mainly on the difference in the character of the dorsal scales, which are much smaller and more granular than in true *Ophiops*, although they are distinctly keeled and imbricate. Quite recently Proc. A. S. B., July 1872, p. 126, Dr. Stoliczka has described a second species *Gymnops meizolepis* from Kalabagh on the Indus. This has somewhat larger scales than *G. microlepis*, but it possesses the same elongate form, the tail from the anus being more than twice the length of the body, and it again presents the peculiarity of a single postnasal instead of two or three as in *Ophiops*.

But the name *Gymnops*, whether considered as generic or subgeneric, cannot be retained for this type of naked-eyed lizards, as it has been twice employed in ornithology, having first been applied by Spix to a South American genus of Raptores, for which, however, an earlier generic title viz., *Daptrius* existed, secondly by Cuvier to a Malayan genus of *Sturnidæ*, allied to *Eulabes*.

Under these circumstances I propose to change the name of the Indian lacertian genus, above specified, to *Chondrophops* in reference to its somewhat granular scales.

